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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •

April 26, 1941

Ready to Roll

See Page 265

A SCIENCE SERVICE PUBLICATION

Do You Know?

A new *fruit* from Jamaica is a triple-crossed tangerine, lime, and grapefruit.

A factory in Brazil will turn *oranges* into concentrated juice, cattle fodder, and paper pulp.

Washing dishes right to left is efficient for a right-handed person, home economists point out.

At outbreak of war, Norway's *merchant fleet* totaled more than 1,000 ships; most of them are now in Allied service.

A chemical treatment has been found to prolong the life of *sandbags*—important to defense and to flood preparedness.

Making clear and accurate *X-ray* dental films is one of the most difficult X-ray photographic tasks, says a dental college instructor.

The *cropland* area of the United States today is 415 million acres, 342 million classed as "good," but most of it endangered by erosion.

Bridgeport's police department has invented and built a *"bomb taxi,"* a tank-like car for safe transport of bombs and suspicious articles to an isolated place for destruction.

Discovery that the eye disease *trachoma* can be cured with sulfanilamide treatment has war-time value, since this is a contagious malady of Mediterranean lands and spreads with troops or refugees.

Potatoes are a source of vitamin C, providing one-sixth to one-fourth of a soldier's daily quota of this vitamin.

Since at least one person in 100 is likely to *stutter,* the United States has 1,300,000 stutterers, says a professor of speech at Syracuse university.

From French nurseries, Germany has obtained stocks of young *fruit trees* valued at nearly $3,000,000, according to reports received by the U. S. Office of Foreign Agricultural Relations.

Tiny *marine bacteria* are "fifth columnists" of America's shipyards, causing $100,000,000 expense annually.

China's 3,000 *cooperative* workshops turn out almost $500,000 work of manufactured goods a month for civilian and army needs.

One construction company advises that for adequate lighting and ventilation a living room should have *window surface* equal to one-eighth of the floor area.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

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BIOLOGY—MEDICINE

Influenza Virus Much Smaller Than Previously Supposed

Larger Particles, Once Thought To be Virus Units, Now Believed Normal Cell Components Carrying Them

THE INFLUENZA "bug" that made so many people sick last winter is only one-eighth or perhaps one-tenth the size scientists had previously believed it to be, although that was much too small to be seen even with powerful microscopes.

The diameter of each disease-causing unit of influenza virus is 10 millimicrons or less, Dr. Leslie A. Chambers and Dr. Werner Henle, of the University of Pennsylvania School of Medicine, told the Federation of American Societies for Experimental Biology in Chicago.

A millimicron is a millionth part of a millimeter, which is only .03 inch.

Since the scientists could not possibly see such tiny particles, they had to measure them in various indirect ways, using powerful centrifuges that separate particles of known size from still smaller ones, studying the speed with which particles move through a liquid and checking the calculated measurements with the electron-microscope. Although this instrument will show particles as small as 20 millimicrons in diameter, it did not show the influenza virus particles.

The eight or ten times larger particles which scientists had previously believed were the individual units of the flu virus are now believed to be normal components of body cells which carry the tiny virus particles.

Not only influenza virus but a virus used to make smallpox vaccine and another virus commonly found in the brains of mice are also much smaller than previously supposed and are probably carried on the larger particles which scientists had believed were the virus particles themselves. This was discovered by Dr. Jaques Bourdillon, also of the University of Pennsylvania, in studies of the rate at which viruses moved through a solution. The smaller particles believed to be the real viruses move more rapidly, he found, than the larger, carrier particles.

Science News Letter, April 26, 1941

Morphine May be Safe

PAINLESS childbirth may, contrary to previous medical opinion, be achieved wtih safety by giving morphine or one of its derivative drugs to mothers, it appears from experiments reported by Dr. Franklin F. Snyder, assistant professor of obstetrics and gynecology at the University of Chicago, and Dr. Kha Ti Lim, of Peking, China, Union Medical College.

Doctors heretofore have believed it was unsafe to give morphine to abolish the pains of childbirth because the drug was supposed to interfere dangerously with the breathing of the unborn child.

Unborn rabbit babies, the scientists found, continued to breathe rhythmically for two hours or longer even when their mothers had been given 15 times the dose of morphine required to deaden pain. Various other morphine compounds with powerful pain-killing effects were also studied.

"The results," Dr. Snyder declared, "suggest obstetrical usefulness."

Science News Letter, April 26, 1941

Arthritis Blood Differs

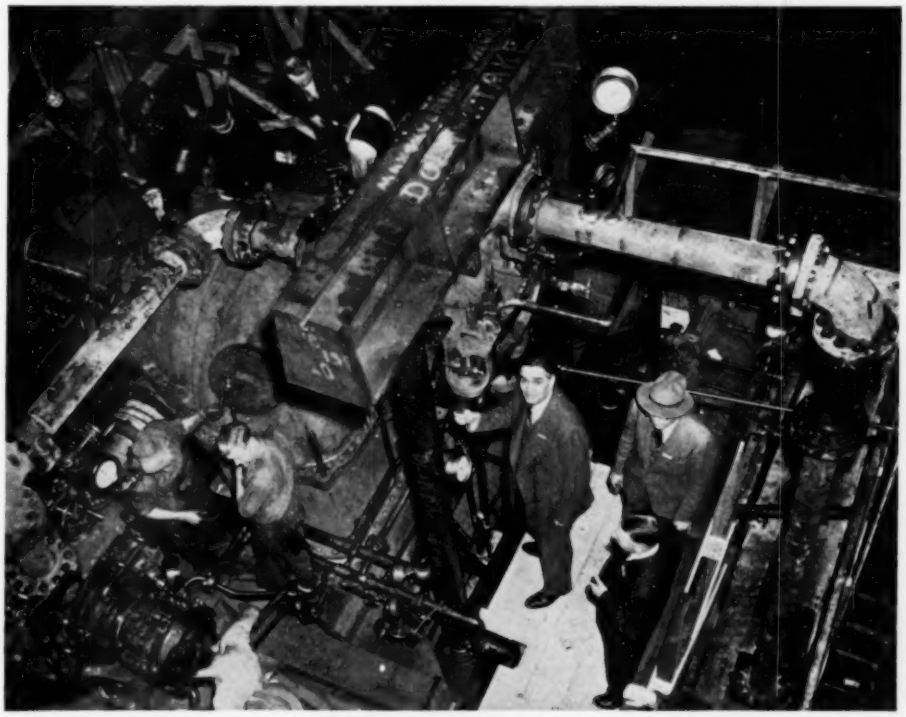
THE protein in the blood of patients with arthritis is different from that in the blood of normal persons, Dr. Otto H. Müller, of Cornell University Medical College, discovered through a test derived by a scientist in Europe, Dr. R. Brdicka, to study cancer and infectious diseases. This is the first application of the test to the study of that baffling and widespread ailment, arthritis.

Patients with gout did not show any significant difference from normal persons in this blood test.

Science News Letter, April 26, 1941

New Test for Vitamin B_1

A NEW way of determining whether or not a person is getting enough of the morale vitamin B_1, one of the "must" ingredients of the new enriched



INSPECTION

Recently appointed Assistant Secretary of the Navy Ralph A. Bard, inspects a boiler which is destined to be used in the new Navy. This boiler is being built at the Westinghouse plant in Lester, Pa., where steam equipment for about 100 fighting ships and merchant marine is being produced for defense. A. W. Robertson, chairman of the Board, and Vice-President R. A. McCarty are the Westinghouse officials who showed Secretary Bard about the plant.

flour and bread, was announced by Dr. Daniel Melnick and Dr. Henry Field, Jr., of the University of Michigan.

The test is made by giving a known amount of the vitamin and then determining the amount excreted via the kidneys during the next four hours. Normal persons excreted an average of 12% of the original dose within the four hours, but patients who had been on a diet deficient in the vitamin excreted only 3% of the original dose during the four hours. The remainder was absorbed by their bodies, indicating the previous lack of the vitamin.

New evidence of this vitamin's importance to health was obtained by Dr. E. S. Guzman Barron, Dr. Carl M. Lyman, Dr. M. A. Lipton, and Dr. James Goldinger, of the University of Chicago. Vitamin B_1, they reported, combines with phosphate to form an enzyme or ferment without which the kidney cannot produce sugar or the heart and brain produce citrate.

Science News Letter, April 26, 1941

Army Rations Okay

U. S. SOLDIERS on average Army Post rations apparently get all the vitamins they need. Daily supplements of pellagra-preventing nicotinic acid, of morale vitamin B_1 and of anti-scurvy vitamin C given to eight representative infantrymen at Fort Snelling did not make them feel any better nor show any favorable effect on heart rate, blood pressure, blood hemoglobin and other conditions tested after 15 minutes of marching, with pack and rifle, at nearly four miles per hour on a motor-driven treadmill with a 12.5% grade.

The tests were made over an 11-week period by Dr. Ancel Keys and Dr. Austin F. Henschel, of the University of Minnesota, under the sponsorship of the Surgeon General of the U. S. Army and the National Research Council.

Science News Letter, April 26, 1941

Make Own Drinking Water

MAMMALS which live in salt water, such as seals, get their vitally necessary fresh water supply from the food they eat and they have a special kidney mechanism for preserving this meager fresh water supply, Dr. Edwin P. Hiatt, of New York University, and Dr. Stanley E. Bradley, of Mount Desert Island, Me., Biological Laboratory, discovered.

Science News Letter, April 26, 1941

Clues to Bone Disease

CLUES to the cause and cure of a strange bone disease may result from a delicate operation on the heart said to have been performed successfully for the first time and reported by Dr. M. Mendlowitz and Dr. A. Leslie, of Mount Sinai Hospital, New York City.

The operation consisted in making a passage between the pulmonary artery, which carries blood to the lungs, and the left heart chamber, which receives blood from the lungs. This short-circuiting operation allowed part of the blood to circulate around the body without passing through the lungs where it normally goes to pick up oxygen.

The operation proved, it was stated, that an animal can live even though part of its blood is shunted past the lungs. As a result of the operation the rate of heart beat increased, more red blood cells appeared in the bone marrow, where they normally originate, and the oxygen content of the blood was lowered.

X-rays of the dogs on which the operation was performed showed increased bone development similar to that seen in hypertrophic osteoarthropathy, a human bone disease in which the bones become oversized. This bone disease is believed due to disease of the lungs in which toxic matters are absorbed from diseased areas. For this reason, it was pointed out, further studies of dogs that have had this delicate heart operation may throw light on the cause and cure of the bone ailment.

Science News Letter, April 26, 1941

Acne From Sex Hormone

TREATMENT of acne, that troublesome skin eruption that usually occurs during adolescence, may be revised in the light of the discovery that it can be induced by doses of male sex hormone substance, testosterone propionate. The discovery was reported by Dr. James B. Hamilton, of Yale University School of Medicine.

A group of men who had not matured sexually and who never had acne, were given the male sex hormone, whereupon they developed typical blackheads and pimples. The same result following male sex hormone treatment was seen in men who had been castrated and women who had lost their ovaries because of disease or accident. When the sex hormone treatment was stopped, the acne cleared up rapidly.

Doctors have long suspected a relation between acne and sex hormones, but no direct experimental evidence for it had previously been established.

"The fact that sex hormones may induce acne in susceptible individuals," Dr. Hamilton pointed out, " is not proof that the sole cause of acne is the action of the hormone. Other factors and a predisposition to acne undoubtedly are of great importance."

Science News Letter, April 26, 1941

Test for Paralysis Harm

A NEW test that may help in treatment of infantile paralysis was announced by Dr. A. T. Milhorat and Dr. T. P. Almy, of Cornell University Medical College.

The test would be made by injecting two drugs, prostigmine and physostigmine, into the body. In some infantile paralysis patients the prostigmine caused twitchings of muscles in which no adventitious movements had previously been noticed, it was discovered. This phenomenon would probably be useful, Dr. Milhorat said, for determining the paralytic involvement of muscle groups which on neurological examination appear not yet to be affected by the disease.

Treatment to strengthen muscles and to prevent crippling from overuse of one set of muscles would, it appears, be helped by the knowledge this test could give of which muscles and nerves are affected.

Science News Letter, April 26, 1941

Food From Sheep's Wool

JUST as if to make things more upside-down than they already are in a world in which chemists have produced wool for clothing from cow's milk, a report suggests that sheep's wool may be made into a source of food.

So far, the sheep's wool powder has only been used as food for rats. They can digest it all right and when supplemented by other dietary ingredients, it proved to be a good source of certain protein constituents, Dr. Joseph I. Routh, of the State University of Iowa, found.

The similarity between rats and humans in their dietary requirements suggests that the powdered wool might become a food source for men as well as rats.

Science News Letter, April 26, 1941

The Indian influence in American fashions includes new Indian *tweeds* and woolens which the Sequoyah Indian Training School in Oklahoma is producing.

PSYCHOLOGY

Wolf-Child Stories Are Doubted by Psychologist

Evidence Entirely Hearsay; Idiots Display Many of Same Behavior Characteristics, It Is Pointed Out

STORIES of children suckled and brought up by wolves and other wild animals were dismissed as unfounded by Dr. Wayne Dennis, of the University of Virginia, speaking before the Southern Society for Philosophy and Psychology.

Kamala and Amala, Indian "wolf children" whose nurture by wolves is accepted by some prominent American scientists are included by Dr. Dennis among those for whom there is "no good evidence."

What evidence there is for these tales of wild children is entirely hearsay, Dr. Dennis declared.

"The fact that the persons who have published accounts of children reared by animals have been persons of unquestioned integrity should not be permitted to prejudice the cases," he said. "All were writing what they had heard from others. The scientist's information in this case was no better than the hunter's or peasant's or soldier's information."

Of the 14 reports of wolf-children, 12 have come from India, where the myth of a child reared by animals is very widespread, Dr. Dennis explained. Kipling employed this idea in his story of Mowgli, and he may well have found the story in India.

"Since the idea of wolf-children is current in India," he said, "if a mute, who could give no account of his past, were found in India at the present time, it is easy to guess the direction of speculation concerning his origin. . . . India possesses a large number of unfortunates to whom such a myth could be fitted."

Suggesting that idiocy would explain the condition of Kamala as described, just as well as the theory that she was nurtured by wolves, Dr. Dennis compared facts related about wild children with what is known of idiots.

Kamala, after painstaking teaching until she was 16, could speak only 50 words. Low-grade defectives are also deficient in language.

Wild children, if not entirely mute, make animal sounds. The utterances of mute idiots "mostly consist of inarticulated grunts, screeches and discordant yells."

Wild children are untidy. So are mentally defective children.

Wild children eat things civilized man considers disgusting. Idiots will eat and drink anything which comes within their reach.

Wild children frequently are said to be insensitive to heat and cold. The lower grades of the mentally deficient are also observed to lack temperature sense.

Wild children show little or no attachment to human beings. This has been observed also in an institution for the feebleminded.

Wild children cannot walk upright. Neither can many idiots.

The argument that Kamala and other wild children must have been intelligent in order to shift for themselves in the wild is answered by Dr. Dennis.

"In practically no case do we know how long the individual really shifted for himself," he said. "If he were taken some distance from home and released, or if he were driven from home, or if he wandered sufficiently far from home so that he was lost, he need not have supported himself for more than a day or a few days before being found.

"His muteness, his stupidity, would make it impossible for him to account for his past."

Dr. Dennis assured the psychologists that he was not trying to prove that children have not lived with animals. He is merely skeptical.

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CHEMISTRY

Award for Discovery Of Pantothenic Acid

DR. R. J. WILLIAMS, of the University of Texas, is the 1941 recipient of the Mead Johnson and Company $1,000 vitamin B complex award, it was announced at the meeting of the American Institute of Nutrition in Chicago. The award was made for Dr. Williams' "outstanding work in the discovery, isolation and identification of pantothenic acid."

Science News Letter, April 26, 1941

TESTS FOR DEFENSE

These scientists at the National Bureau of Standards are measuring the tautness of doped airplane fabric which has been stretched across the standard frames to make comparative tests.

PHYSIOLOGY

Immortal Fatherhood

Biologic "Time Machine" Chilling Life to Standstill May Enable Today's Great to Have Sons Generations Hence

By WATSON DAVIS

A MILLENNIUM in the future a man now alive may be able to have a son. The human race, thanks to startling findings of physiological science from several university laboratories, may be standing on the brink of a sort of "immortality."

An American physiologist has suggested a way to produce one of the effects of H. G. Wells' famous and highly fanciful "time machine."

Life is chilled into standing still. The "private time" of a little gob of human male reproductive cells is essentially changed, while "public time," measured by the grind of the earth around the sun, or by the routine births, living and deaths of generations after generations of living things, goes on apace.

Because his wife had a fever of 104 degrees F. one afternoon nine years ago, Prof. Hudson Hoagland of Clark University, Worcester, Mass., made the observations that eventually led to his cautious report to the Federation of American Societies for Experimental Biology at Chicago. While Mrs. Hoagland lay ill with a burning fever of influenza, she asked Dr. Hoagland to do an errand at the drug store. He was gone only twenty minutes. Mrs. Hoagland insisted that he must have been gone at least an hour. Since, as Dr. Hoagland says, "She is a very patient lady," this immediately set him first to thinking and then hurrying to find a stop-watch.

Sickroom a Laboratory

The sick room became a laboratory. He asked his wife to count sixty at a speed that she believed to be one per second. He had her do this thirty or forty times during her illness without telling her why. At the time of each counting he noted her temperature and recorded the actual lengths of her estimated minutes with a stop-watch. This is what he found: Her counting was much faster at temperatures higher than normal, and slower at temperatures below normal, although she believed her counting rate was always constant.

Mrs. Hoagland's time sense galloped along more swiftly under the effects of the fever temperature; her "private time" slowed down when she had a sub-normal temperature.

That is the reason that Dr. Hoagland disagrees with the words of the eminent British astronomer, Sir James Jeans: "Time does not cease to unfold itself at a uniform and uncontrollable rate which is the same for each one of us." Sir James meant what Dr. Hoagland calls "public time," the time measured by the earth's rotation on its axis. Dr. Hoagland was interested in our personal subjective appreciation of duration, which his wife had taught him varies with temperature.

For even when we are asleep our time sense continues to function. We are human alarm clocks; it is no uncommon thing for a person to awaken himself in the morning within ten or fifteen minutes of the time he had set himself for.

How Pace of Life Is Set

Why then does our personal clock, our biological clock, run at different rates? His physiology gave Dr. Hoagland the clue. The pace of life is set by the continuous oxidation or burning of foodstuffs by all living tissues, the brain included. These chemical processes basic to life are known to be markedly affected by temperature. The Swedish chemist Arrhenius years ago worked out the relation of chemical reaction and temperature. Up the temperature 10 degrees Centigrade (18 degrees F.) and the speed of most chemical reactions doubles or trebles. Dr. Hoagland showed that the speed of counting seconds varies exactly with internal body temperatures according to Arrhenius' equation after the manner of biological oxidations.

If then our sense of time duration depends upon chemical reactions in the brain cells, by speeding them up, higher temperatures should make subjective or private time pass slowly in comparison to public or clock time. In Mrs. Hoagland's case, the actual twenty minutes seemed to her much longer.

In a like manner, with the slowing of these same chemical processes at lower than normal body temperatures, time would appear to pass faster. If we could imagine living organisms at the absolute zero of minus 273 degrees Centigrade private time for them must pass infinitely fast in comparison with clock time. This is because their physiological rates would be infinitely slowed. This is a temperature that science has approached but never quite attained. There all is still; molecular motion and energy manifestations are non-existent.

That gives a hint of the mechanism of Dr. Hoagland's biological "time machine," which is a step beyond his master "chemical clock" of our brain that controls our sense of duration.

Aging Slowed By Cold

This relation between time and temperature makes it possible for living organisms to travel forward into the future, a consequence of the fact that physiological rates, depending on continuous chemical processes, are slowed at low temperatures. All aging processes depending as they do on chemical changes are likewise slowed at lowered temperatures.

Suppose that a living person could be chilled to absolute zero temperature for a thousand or ten thousand years. Time would stand still for him. Suppose at the end of the millennium or ten millennia, he could be warmed to normal bodily temperature, and live normally again. He would be projected forward into time by this "time machine," a Connecticut Yankee in King Arthur's Court in reverse. But even a drop of 15 to 20 degrees of internal body temperature for several hours means death. There is no hope for human "immortality" by that means. The human body is far too complex and big.

So, Dr. Hoagland went to the other end of the scale of life to discover what happens to the small cells themselves when they are quickly cooled to very low temperatures. He dug into the literature and he sought the collaboration of his colleague at Clark University, Dr. Gregory Pincus, who will be remembered for his fatherless rabbits experiments.

Death comes to cells when the water within them crystallizes on freezing, disrupting the cell walls and throwing the delicately balanced chemical machinery out of gear. But it has long been known that low temperature can produce a vitreous instead of a crystalline solid state. The liquid becomes like glass, essentially

a very viscous liquid with properties of a solid. As Dr. B. J. Luyet of St. Louis University has shown, watery solutions of substances made up of large molecules can be vitrified readily by sufficiently *rapid* passage through a temperature range of some 30 to 40 degrees Centigrade below the freezing point of water. Under these conditions life is not necessarily disrupted. The stuff in some small living cells can be vitrified by plunging into liquid air, dropping their temperature 200 degrees per second, so fast that ice has not time to form. Their physiological time virtually stands still at very low temperatures. Warm them rapidly and they are restored to normal living.

Others Had Experimented

The literature showed that for one reason or another (without visualizing the "time machine" idea) many other research workers had experimented with life at low temperatures. Dr. Luyet with P. M. Gehenio published a book last year on "Life and Death at Low Temperatures." Other scientists, as well, showed that a great variety of small living organisms survive rapid cooling and subsequent rapid warming. Dr. W. Stiles was the first to show the importance of rapid cooling and warming in making possible a state of suspended animation. Most important, the length of time endured in the vitreous state of most of the organisms studied seems to have no effect on the percentage of organisms reviving. Dr. L. B. Shettles of Johns Hopkins University vitrified and revived a very small percentage of the male human reproductive cells, sperm, and Dr. Luyet had earlier demonstrated this for frog sperm. Cells once vitrified may be kept safely in storage at temperatures only 30 to 40 degrees below zero Centigrade.

If man himself cannot take the journey into the future, he may be able to send his immediate sons. That is the way that Dr. Hoagland reasoned. He and Dr. Pincus set to work. They confirmed Dr. Shettles' finding that human sperm survive immersion in liquid nitrogen at 195 degrees below zero Centigrade. With improved technique and treatment, they succeeded in reviving 30 to 40 per cent of the sperm given this frigid treatment. They also have been able to revive a small percentage of similarly treated rabbit and bull sperm, although human sperm withstands the treatment better than those of other mammals studied. The fertilizing ability of revived sperm is yet to be proved, although this seems most probable.

The "time machine" is about ready to be given a test run. The parts are ready. Just as the first experiments will be upon lower animals, such as guinea pigs, rabbits and cattle (for such is the way of science), the practical application will be made first to animal breeding.

Artificial insemination is a growing practice in animal husbandry, but under present conditions the male reproductive cells cannot be kept in storage for more than four days. If the new vitrification method proves practical, a great horse-like Man o' War could have immediate sons many generations after his death. Dr. Hoagland suggests that through this method of stored germ plasm prize stock could be renewed years in the future even if faulty breeding allows it to degenerate.

Suppose these things had been known in the time of Socrates or Shakespeare or Newton. Their sons might be walking among us, mothered by virtuous females enamored of the past.

More frequently than the public knows, couples who otherwise would be childless call upon medical skill to give them the pleasures of parenthood. The biological father in such cases remains a remote and anonymous donor.

Dr. Hoagland, more or less humorously, has suggested the possibility that his biologic time machine, social sanctions permitting, might allow a part of each generation of the future to be fathered by the truly great men of the past, whose genius and qualities have stood the test of history.

In a disordered world bent on human destruction, profligate with life, it would be genetic insurance for the future if we could set up storehouses of precious human germ plasm. Our sons and daughters of a few centuries hence might value this inheritance more than all the gold at Fort Knox.

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Clerks in the Middle Ages, who slipped English words into their account books when they could not think of the Latin, have provided editors of a Middle English Dictionary several thousand English words for objects, tools, and farming and industrial operations.

Trees ten inches in diameter should stand ten feet apart, says a forestry specialist, citing a general rule that, for free growth, trees may well be allowed as many feet of distance apart as the stem diameter of the trees in inches.

FUTURAMA

Visitors to the 1940 New York World's Fair, who stood in a long line for an hour or so to look at the famous "Futurama" will be glad to learn that the Futurama is to appear in a smaller edition at the New York Museum of Science and Industry. Many of the original objects for the World's Fair exhibit are retained in the Museum's display. Visitors will not be able to sit in those nice moving chairs, but neither will they have to wait in line.

PHYSIOLOGY

Iron Gets to Milk Five Minutes After Cow Eats

IRON will appear in a cow's milk within five minutes after the animal is fed iron-containing food, Dr. Lowell Erf, research fellow in the Radiation Laboratory of the University of California, found by experiments with radioactive iron.

These experiments upset the former theory that it took a considerable length of time for iron elements of food to be assimilated and taken up by the lactating cells.

This speed of assimilation is credited to rapid enzymic action which was not heretofore suspected. Enzymes are digestive agents that break down foods into their various elements, and thus prepare them for further digestive action and body usage.

Two cows were used in the experiment. Radioactive iron particles from the university's atom-smashing cyclotron were added to the cows' food, and the radioactive iron followed the same course through the animals' bodies that food-iron traveled. Radioactive atoms are continually exploding and emitting radiations which may be traced by a sensitive instrument. Almost immediately after ingestion of the "tagged" iron, it appeared in cows' milk.

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MEDICINE

Beefsteak Bottleneck Overcome in Vein Feeding

THE beefsteak bottleneck in the way of efforts at artificial feeding of a full meal through the veins instead of by the mouth has apparently been overcome by a research team at the University of Rochester School of Medicine and Dentistry.

Technical details are reported (*Science*, April 4) by Dr. G. H. Whipple, Nobelist who contributed to the discovery of the liver treatment for pernicious anemia, Dr. S. C. Madden, Dr. L. J. Zeldis, Dr. A. D. Hengerer and Dr. L. L. Miller.

Many patients too sick to take nourishment by mouth could be benefited and many experiments performed, the Rochester scientists point out, if doctors had a way of feeding a complete diet by other than the oral route.

Sugar, salt and water can be given by injections into the veins. About the only way to give the patient the equivalent of a beefsteak, however, has been to inject the proteins from blood plasma. This material is being widely used instead of whole blood transfusions for treatment of shock, but the supply for use as a food substitute is relatively limited.

To overcome this bottleneck, various scientists have prepared meat and other digests. The Rochester scientists prepared a digest from commercial casein, which is the chief protein of milk, and papain, a digestive ferment. When dried, this digest is a golden yellow granular material containing 12.5% protein. When made into a solution and given to dogs by injection into a vein, it proved as effective as whole liver fed by mouth in promoting production of proteins in blood plasma.

The scientists conclude their scientific report by stating that the success of the digest in artificial feeding of dogs "holds great promise" in treatment of human patients.

Science News Letter, April 26, 1941

PUBLIC HEALTH

Evacuated Children Benefitting From Country

CHILDREN evacuated from London and other English cities to safe shelter away from bombed areas are gaining in health as a result of their stay in the country, Dr. Martha M. Eliot, assistant chief of the U. S. Children's Bureau, found on her visit to England as a member of the Civil Defense Commission.

No one in England, of course, has had time to make scientific studies of the children's health, but from her observations and from statements made to her, Dr. Eliot believes the health effect of the country life has been good. The English authorities, and Dr. Eliot herself, were also impressed with the broadening effect on the children's mental outlook that the change of surroundings has given them.

The children have stood the psychological effect of bombing much better than grown-ups, Dr. Eliot was told. A small proportion have suffered from anxiety neurosis of a mild type as a result of experiences during air raids. Child guidance authorities are working with government authorities to develop as rapidly as possible a program giving these children proper care so that the neurosis will not be lasting.

Child welfare problems now facing the English are: further improvement in placement of evacuated children in homes suited to each child; plans for reuniting the children with their families after the war.

Science News Letter, April 26, 1941

IN SCIEN

MEDICINE

New Treatment for Burns Undergoing Tests

A NEW and possibly revolutionary method of treating severe burns is undergoing tests at the Johns Hopkins Hospital. News of the work spilled out prematurely, to the regret of the authorities and scientists concerned.

The identity of the healing substance is not yet known. Consequently the new treatment cannot be announced yet and no official announcement of the work has been made. The unofficial report stated that sulfadiazine was used in the new treatment, but the scientists do not know that this is the substance which heals burns.

Further tests which will take at least a month are necessary before a report telling what the new treatment is can be made.

Science News Letter, April 26, 1941

PUBLIC HEALTH

Industrial Uses Now For Cosmetic Creams

COSMETICS have industrial uses now. A vanishing cream can be obtained for protecting against cutting compounds; another ointment protects against certain acids. (*Millburn Co., Detroit.*)

Science News Letter, April 26, 1941

MEDICINE

Polyneuritis Unbenefited By Big Vitamin Doses

INTENSIVE vitamin therapy used on patients suffering from polyneuritis caused by alcoholism does not allow the patient to leave the hospital any sooner than treatment with the routine hospital diet that contains adequate but not excessive vitamins, according to a study of 18 years of experience, Dr. Madelaine R. Brown of Boston City Hospital reported. (*Journal, American Medical Association*, April 12.)

Alcoholics suffering from the painful disease did not seem to be able to utilize more vitamins than are adequate to a healthy person.

Science News Letter, April 26, 1941

NCE FIELDS

INVENTION

Angler Can Now Weigh Big One That Gets Away

EVEN the big one that gets away may be weighed by the fisherman for corroboration of his incredible tale, with a built-in scale attached to the fishing rod just forward of the reel, in a new invention patented by Abraham J. Scheckter of Jamaica, N. Y.

The line passes from the reel through a tube in the scale, which is provided with a clutch arrangement to take hold of the line when desired by the angler. Thus, if you can keep your fish hooked long enough to lift it clear of the water you can weigh it—even if it manages to wriggle off the hook an instant afterwards.

Science News Letter, April 26, 1941

ICHTHYOLOGY

TVA Reservoirs Becoming Fishermen's Paradise

"FISHING intensity on the lower TVA reservoirs is similar to that found on several northern lakes," Clarence M. Tarzwell and Lawrence F. Miller, TVA fish specialists, reported before the meeting of the American Society of Ichthyologists and Herpetologists in Gainesville, Fla. They estimated that these great artificial lakes accounted for over 1,100,000 "man days" of fishing in 1940.

The two fisheries men made careful counts of fishermen at their favorite avocation on the four lower TVA reservoirs: Guntersville, Wheeler, Wilson and Pickwick, from March to December, 1940. They took into account such factors as day of the week, condition of weather, and fishing modes and sites.

Analysis showed that fishing was most intensive in April, May and June, after which it declined to the season's low in December. At first there was a weekly cycle, but later bad weather was the main thing that kept fishermen at home. Most fishing went on just above and below the dams, and near centers of population; least fishing was observed in the upper reaches of the reservoirs and on the wide waters above the dams.

Bank fishermen predominated along the shores of the reservoirs proper; boat fishermen were most numerous in the tailwaters just below the dams. Wheeler Reservoir, with 6.4 man-days of fishing per acre, was most heavily fished. Second was Wilson, with 4.5 man-days per acre. During the spring months bank fishing was heaviest on Guntersville Reservoir.

Science News Letter, April 26, 1941

CHEMISTRY

Priestley Medal Awarded For Tetra-Ethyl Lead

DISCOVERY of the anti-knock properties of tetra-ethyl lead, now used in most of the gasoline sold in the United States, as well as other outstanding achievements in chemical science, has won for Dr. Thomas Midgley, Jr., of Worthington, Ohio, the American Chemical Society's highest honor, the Priestley Medal. This was was announced at the Society's 101st meeting in St. Louis. Actual presentation of the medal will take place at the 102d meeting next September in Atlantic City.

Vice-president of the Ethyl Gasoline Corporation, Dr. Midgley is 51 years old, and a graduate of Cornell University. He is also known for his work on refrigerants used in air conditioning.

After the meeting of the Society, held last September in Detroit, Dr. Midgley was stricken with infantile paralysis, but despite this affliction, he took part in the St. Louis meeting, and is still actively directing research.

Science News Letter, April 26, 1941

ZOOLOGY

Ball Python Upsets Zoological Ideas

See Front Cover

BORN, to a female ball python at the Hershey Estates zoo, eleven lively, wriggling infants.

This is a complete upset of a long-held zoological doctrine, still printed in all the books, that all pythons are egg-laying snakes, states Ward Walker, director of the Hershey zoo. Plenty of snakes do bear their young alive, including such common species as water-snakes and garter-snakes, but until now the Old-World pythons had not been known to be anything but egg-layers.

The ball python gets its name from its habit of rolling up into a compact ball when disturbed or frightened. It can then be rolled about rather roughly, but refuses to uncoil. Its native home is West Africa.

Science News Letter, April 26, 1941

ASTRONOMY

Year's First Comet Leaves, But Will Be Back in 2313

PERHAPS you missed seeing the Friend-Reese comet, first of these objects to be discovered in 1941. It is rapidly departing from this part of the solar system, but earth dwellers will have another chance to see it when it comes back.

This will be in the year 2313, according to calculations made by Dr. A. D. Maxwell, of the University of Michigan Observatory. Basing his computations on measurements of the comet's position by Dr. George Van Biesbroeck, of the Yerkes Observatory, on Jan. 19, Feb. 1 and 16 and March 1, he finds that the comet's orbit is definitely an ellipse. It moves around it every 372 years.

The comet was found independently in January by two amateur astronomers, Clarence L. Friend, of Escondido, Calif., and E. J. Reese, of Uniontown, Pa. Even when brightest it was too faint to be seen without a telescope.

Science News Letter, April 26, 1941

ASTROPHYSICS

Connection Between Sun's Rotation and Radiation

STRONG evidence of correlation between the 27-day periodic changes in the heat and light given off by the sun and the appearance of the sun itself has been found by Dr. Charles G. Abbot, secretary of the Smithsonian Institution, in photographic records preserved at Mount Wilson Observatory in California. (*Science*, April 11.)

Studying instrumental records of fluctuations in the sun's radiation obtained by observatories of the Smithsonian Institution, Dr. Abbot came upon five sharply marked periods during 1929 and 1930. "Sight unseen," he prophesied that solar photographs taken on those particular groups of days would show corresponding changes in the appearance of the face of the sun, particularly in the emergence or rapid growth of sunspots.

Accordingly, he wrote to Dr. W. S. Adams, director of the Mount Wilson Observatory, where photographs of the sun are taken every day, asking for pictures taken on dates marked by the fluctuations in his own instrumental records. When the photographs arrived, he reports, he found a hundred per cent correspondence between changes in solar radiation and changes in the appearance of the sun.

Science News Letter, April 26, 1941

ASTRONOMY

Summer Promise

In Evening Skies of May, Stars Above Point to Warm Days Ahead; Winter's Orion is Already Gone

By JAMES STOKLEY

TO the May evening skies the stars overhead bring the promise of summer. Orion, dominant constellation of winter, is gone; only a few of his neighbors remain low in the west. Low in the southeast the scorpion, Scorpius, is beginning to appear. Antares is visible just above the horizon. This is the star that shines so brightly with it's ruddy hue in the southern sky on evenings of July and August.

The appearance of the heavens at 10 p.m. (standard time) at the beginning of May, and an hour earlier in the middle of the month, is indicated on the two semicircular maps. Antares is marked in the one for the southern sky. More conspicuous, however, are the stars higher in the heavens. To the southwest, in Leo, the lion, is the "sickle," a group shaped like a question mark in reverse. Regulus is the bright star at the bottom. To the left of the sickle is a triangle of stars, with Denebola, marking the lion's tail.

Farther left, and about as high as Denebola, is Arcturus, in Boötes, the bear driver. And between Arcturus and Denebola is a cluster of faint stars, Coma Berenices, which honors the beautiful hair of an Egyptian queen. The name means "Berenice's hair." Below Coma is the figure of Virgo, the virgin, with the star called Spica.

Familiar Star Groups

Turning to the northeast, one sees brilliant Vega of Lyra, the lyre, and, underneath, Deneb, in Cygnus, the swan. In the north the familiar "big dipper" of Ursa Major, the great bear, appears high above the pole star. Continuing around to the northwest there shine the remaining winter stars. These are Castor and Pollux, in Gemini, the twins; Capella, in Auriga, the charioteer and, directly west, Canis Minor, the little dog, with Procyon.

No planets are seen very easily in May in the evening, but Mars, in Aquarius, the water-carrier, rises some three hours before the sun.

Looking overhead on these spring evenings, we see something quite different from what we saw when looking up on an evening in September. Not only are the stars entirely different, but there are fewer of them. Then, we could see the Milky Way, arching across the celestial vault, and the bright stars, too, were more numerous.

By making accurate counts of stars, astronomers, since the time of Sir William Herschel, a century and a half ago, have been able to form a pretty good idea of the shape of the stellar system of which we are part. The stars are not countless, as they may seem. There are only about 9000 that can be seen with the naked eye, from all parts of the world, at all times, of which not more than 2500 can ever be seen at once. And while the fainter, telescopic stars are more numerous, even they can be counted by picking selected areas, in the same way that a public opinion poll forms an accurate judgment of the views of the nation by interviewing proper samples comprising relatively few individuals.

Classified by Brightness

Astronomers classify stars by brightness, or magnitude. They get fainter as the magnitude number gets higher. There are 22 stars of the first magnitude, including Vega, Spica, Regulus and Arcturus among those now visible. There are 18 of the second magnitude, making a total of 40 of the second, or brighter. In like manner there are 135 down to the third, 450 down to the fourth and 1500 down to the fifth.

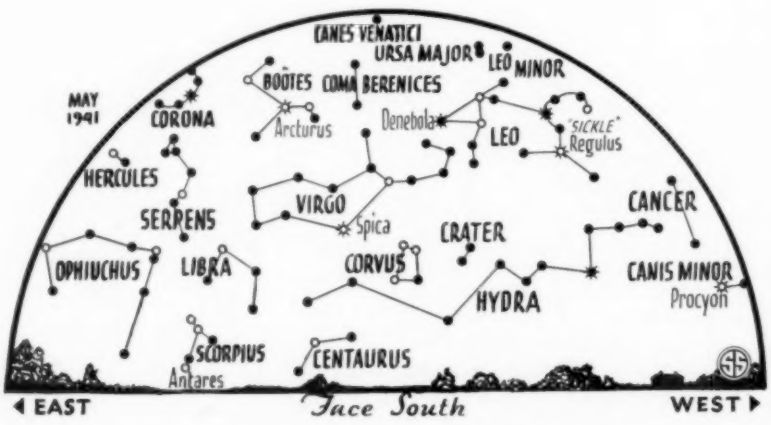
The brightness of an average star of any magnitude is 2.5 times that of the average of the next magnitude fainter. If there are two stars of the same brightness, one at 100 light years distance, the other at 158 light years, the nearer one will be about 2.5 times, or one magnitude, brighter than the farther one. It is true that stars differ in brilliance, but, when you are considering them by the hundreds and thousands, you can take as typical the average. This means, therefore, that as you go to stars of the next fainter magnitude, you go out about 60% farther in distance. When you reach out that much farther, you include a spherical volume of space about four times as big as you had before.

Not Uniformly Distributed

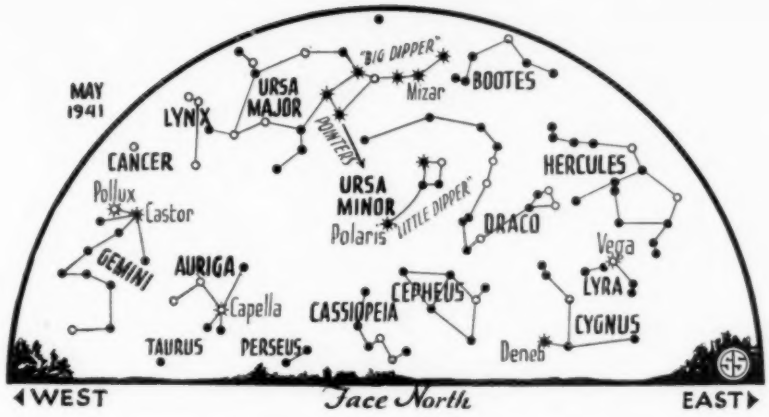
If the stars were uniformly distributed, you would get four times as many stars as you had before with each increase of a magnitude. However, the ratio rapidly falls off. With 135 stars to the third magnitude, and 450 to the fourth, the ratio is 3.3. From 560,000,000 stars down to the 19th magnitude, to the 1,000,000,000 down to the 20th, about the limit of the biggest telescopes, the ratio is only 1.7. At the 30th magnitude, the ratio would be one, in other words, you would have come to the end of the stars.

In this way, it has been learned that our star system is limited in extent. It proves to be the shape of a vast grindstone, in which we are located about a third of the way from the center. When we look to the edge of the grindstone, we see a concentration of stars—this is the Milky Way.

Outside this system, or Galaxy, there are millions of other galaxies similar to



☼ ✷ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS



it, though many of them seem considerably smaller than ours. But this may simply be on account of the fact that we cannot see them well enough. Recent studies of the one in Andromeda, which is among the closest, indicate that it is much bigger than we used to think, nearly as big as our own. So perhaps the others too, are bigger than we now believe, and are true "island universes," each made up, like our galaxy, of hundreds of thousands of millions of stars.

Celestial Time Table for May

Saturday, May 3, 2:59 a.m., Algol at minimum. **Sunday, May 4,** 7:49 a.m., Moon in first quarter. Eta Aquarid meteor shower. **Monday, May 5,** 11:48 p.m., Algol at minimum; 12:00 p.m., Mercury in line with sun. **Thursday, May 8,** 8:00 p.m., Saturn in line with sun; 8:37 p.m., Algol at minimum. **Saturday, May 10,** 2:00 p.m., Moon nearest, distance 222,000 miles. **Sunday, May 11,** 12:15 a.m., Full Moon; 5:26 p.m., Algol at minimum. **Saturday, May 17,** 8:17 p.m., Moon in last quarter. **Sunday, May 18,** 8:51 a.m., Moon passes Mars. **Monday, May 19,** 3:00 p.m., Jupiter in line with sun. **Friday, May 23,** 1:00 p.m., Moon farthest, distance 252,400 miles. **Monday, May 26,** 12:18 a.m., New Moon.

Eastern standard time throughout.

Science News Letter, April 26, 1941

CHEMISTRY

$2,500,000,000 Declared Yearly Cash Cost of Smoke

Worst Effect, However, Believed To Be on Health; Pneumonia Incidence Highest Where Smoke Is Thick

ACTUAL cost each year to people in the United States on account of smoke is $2,500,000,000. In addition there is incalculable cost to health, W. L. Jones and Dr. F. E. Vandeveer told members of the American Chemical Society meeting in St. Louis. Dr. Vandeveer is connected with the American Gas Association Testing Laboratories at Cleveland, while Mr. Jones is with the St. Louis County Gas Company.

The wastage of coal, gas and oil fuels, due to the incomplete combustion which causes smoke amounts to $200,000,000, they said. In addition, the extra cleaning of buildings, and laundering or dry cleaning of wearing apparel and house furnishings and their shortened life, account for the remainder of the staggering total.

"Probably the worst aspect of smoke is its effect on health," they declared, "While this relationship is difficult to evaluate, correlation of smoke and high incidence of pneumonia seems to have been clearly established. Much evidence exists that death rates from pneumonia and other respiratory ailments are greater in smoky industrial centers than in small urban communities. The effect of smoke in depriving people of sunlight is another broad aspect of the smoke problem, and one which probably has an important bearing on health."

They advocated wider use of gas as a fuel to overcome smoke troubles, because it can be burned more efficiently and completely than some other fuels.

Science News Letter, April 26, 1941

Should Synthesize Hormone

COMMERCIAL preparation and clinical use of certain highly important chemicals produced in the adrenal cortex need improvement as a national defense measure, Dr. E. C. Kendall, of the Mayo Clinic, indicated.

One of these chemicals, known as compound E, has a "remarkable influence on the resistance to shock and toxic substances," Dr. Kendall pointed out. It also has an effect on the capacity of muscle for work.

Any use it might have in treating shock due to war wounds, however, or for other medical purposes is limited by the fact that the total annual supply of this and another important adrenal gland chemical in the United States, derived from animal glands, could not be greater than about one pound.

The other chemical is called compound F for short. These two should not be confused with vitamins bearing the same letters for names. Both these adrenal gland chemicals have "a striking effect upon the enzymes involved in the conversion of proteins of glucose."

The effects achieved by compounds E and F are not achieved by another chemical from adrenal gland cortex, desoxycorticosterone acetate, which has been used in recent years to keep alive patients suffering from Addison's disease, the once-fatal ailment characterized by a strange bronze discoloration of the skin. To make these other compounds available for the many uses they may have in war and peace time medicine, chemists must produce them synthetically. Dr. Kendall said synthetic production is the only possible solution to the problem of the shortage of compound E.

Science News Letter, April 26, 1941

Poison Gas Hazard Increases

INDUSTRIAL workers may be increasingly exposed to the poison gas, hydrogen selenide, because of the increasing use of selenium in industry. Guinea pig tests showing the marked effect of exposure to this gas in varying concentrations were reported by H. C. Dudley and John W. Miller, of the National Institute of Health, U. S. Public Health Service.

Protective measures to reduce the hazard of hydrogen selenide poisoning to a minimum should be taken, the scientists suggested, when the odor of the gas can be detected.

The gas tires the sense of smell quickly so that after several minutes exposure

concentrations of .001 milligram per liter cannot be noted. At this concentration the gas can be tolerated but at higher concentrations it causes irritation of eyes and nose and a metallic taste which persists for several days, it was found from cases of accidental exposure to the gas.

Livers and spleens of experimental animals were damaged in single exposures to the gas in low concentrations for two, four and eight hours. One-half the animals died after the eight-hour exposure.

Science News Letter, April 26, 1941

Freeze Gases to Find Oil

BY FREEZING gases sucked out of samples of soils, to detect hydrocarbons present in the proportion of a few parts in a billion, it is possible to locate accurately underground deposits of oil and gas.

Leo Horvitz, of "Subterrex by Geophysics and Geochemistry," Houston, Texas, described these new methods to the American Chemical Society at St. Louis. Geophysical prospecting, in use for the past twenty years, he said, can detect salt domes and other subterranean structures which are often associated with oil and gas, but the geochemical process detects the presence of the petroleum itself.

Minute quantities of hydrocarbons migrate from oil and gas deposits to the surface of the earth and the formations encountered retain some of these leading hydrocarbons.

Soil samples are collected from a 12-foot depth over the area to be studied. They are heated under reduced air pressure. This drives out the gases, which are passed through traps cooled to very low temperatures. For instance, at 204 degrees below zero Fahrenheit, pentane and the heavier hydrocarbons are frozen, but the lighter ones get through. Then the gases are subjected to temperatures as low as 278 degrees below zero Fahrenheit and the ethane, butane and propane will be frozen out. Then a still lower temperature, 300 degrees below zero Fahrenheit, will freeze out the methane.

In this way, the concentration of the gases, in parts per billion by weight are determined, and plotted on a map of the region.

"Considerable investigation," said Mr. Horvitz, "indicates that the hydrocarbons leak principally from the edges of the deposit rather than from the center. As a result, it has been found that the significant hydrocarbon distribution pattern is that in which a zone of low hydrocarbon values is surrounded by a band of higher concentrations. This area of low concentration usually coincides closely with the areal extent of the oil field. The order of magnitude of the values in the band of higher concentrations is usually above 10 parts per billion and the average of these high values is usually more than three times that of the values in the low zone.

Science News Letter, April 26, 1941

RESOURCES

Gasoline Shortage in East Seen as War Possibility

Lack of Tanker Tonnage Is Worst Bottle-Neck, OPM Chemical Division Chief Tells Colleagues

A SHORTAGE of gasoline and other petroleum products along the Atlantic Coast is foreseen by experts if there is naval warfare in the Atlantic. A shortage of tankers to bring the crude or refined oil around Florida from the Gulf coast would be the cause.

This possible lack of auto fuel was made known by Dr. E. R. Weidlein, chief of the OPM's chemical division, when he surveyed the chemical situation for the American Chemical Society. Dr. Weidlein is director of Pittsburgh's Mellon Institute.

Distribution, not production, will be the cause of any shortages. Dr. Weidlein emphasized the adequacy of American production by explaining that "The entire military activities of Germany and Italy, plus the industrial and other activities of these countries and of the occupied areas of western Europe, are being carried on with an amount of petroleum plus synthetic products which is only about 5% of our present domestic production."

The petroleum movement from the Gulf coast alone amounts to about 1,350,000 barrels per day and requires the services of a fleet of 260 domestic tankers.

This large tanker fleet normally has some excess capacity, but a combination of circumstances has resulted in a rather tight situation at present, Dr. Weidlein said.

A large percentage of our tanker fleet was built during and shortly after the last war, and hence is nearing the end of its useful life. During the past two years a considerable number of ships have been transferred into foreign service to replace ships which have been sunk and to make up for the longer hauls and less efficient use of tankers brought about by war conditions. Eight large, high-speed tankers have already been requisitioned by the Navy and several more are likely to be requisitioned, especially in the event of war.

Dr. Weidlein declared that "there are a lot of back-seat drivers for the defense program," and admitted that "the car is not yet running in high speed."

Part of this, he said, is because "the chemical industries have been as far away from the munitions industries as it was possible for them to get. World War I plants were dismantled. For future warfare therefore martial machinery must be built from the ground up."

Problems confronting the OPM, Dr. Weidlein said, are minor compared with the conditions faced in 1917. Development of the chemical industry in this country since the first World War has made the difference.

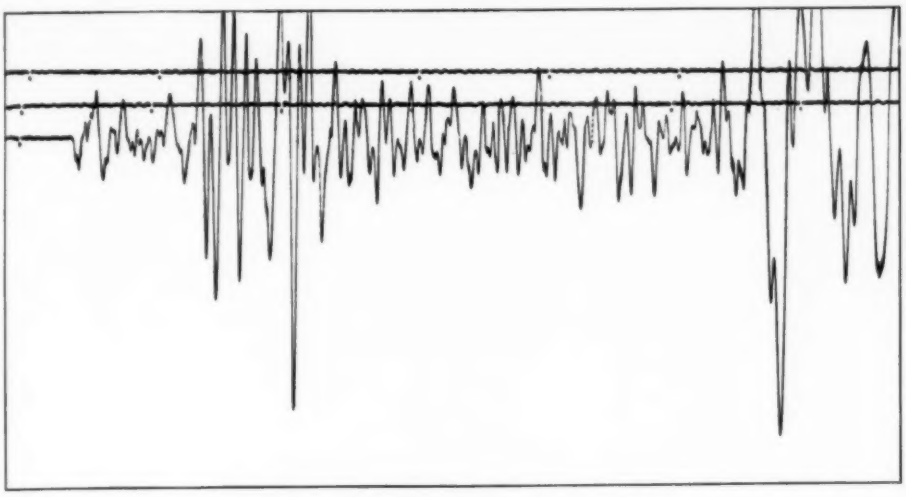
Difficulties in furnishing nitrogen to non-defense uses are foreseen as a possibility.

"Throughout 1941 we will be able to meet all the nitrogen demands of the defense program together with the needs of the industries and agriculture," Dr. Weidlein explained. "The Government through the industries has constructed three new synthetic nitrogen plants and, as a form of additional insurance, imports of sodium nitrate have been increased substantially from Chile."

It requires from 18 months to two years to build a synthetic ammonia plant, while munitions plants can be constructed in a period of eight or nine months. If conditions become serious, it may be necessary to curtail the use of nitrogen for industrial and certain agricultural uses in order to meet the demands.

Science News Letter, April 26, 1941

California used to supply about 2% of the United States' *olive oil*, but with foreign importations cut to 10%, California now is the mainstay source.



THE BEGINNING OF DESTRUCTION

Opening phase of the Colima earthquake, as recorded by seismograph at the Franklin Institute, Philadelphia.

SEISMOLOGY

Earthquake Served First Notice By Disturbing Galvanometers

Hours Later Wires Brought News of Shock That May Have Set Off Eruption of Colima Volcano in Mexico

MEXICO'S earthquake, that "blitzed" the city of Colima on April 15, sent its own first notice to Washington, D. C., by interfering with some work which the National Bureau of Standards was doing for the Army Signal Corps. Dr. Frank Wenner and his aides were testing some electrical apparatus belonging to the Signal Corps. At about 2:20 p.m., the delicately balanced mirrors on three large galvanometers began to swing abnormally, and kept it up for more than an hour. Dr. Wenner knew that a violent earthquake was going on somewhere, and judged from the behavior of his instruments that it might be in Mexico. Not until hours later did belated wire reports bring confirmation.

The earthquake may have set off the reported eruption of Colima volcano, in the opinion of Dr. Emanuel G. Zies, volcanologist of the Carnegie Institution of Washington. This volcano is the westernmost of a string of such peaks that mark a high ridge in an approximately east-west line across Mexico, and joining the coastal range at this point. It is one of the most active mountain-forming regions on earth today, Dr. Zies stated, so that stimulation of an eruption by an earthquake might well occur. Ordinarily earthquakes and volcanic eruptions have little to do with each other, despite a widespread impression to the contrary. The quake's epicenter was about 75 miles southeast of the city of Colima, U. S. Coast and Geodetic Survey seismologists reported, after a study of data wired and radioed to Science Service by a number of observatories ranging from Ottawa to Manila. The spot of greatest disturbance was provisionally fixed as in latitude 18.5 degrees north, longitude 102.9 degrees west. This is in an isolated mountainous region in the state of Michoacan. Exact time of origin was 2:09.8 p.m., E.S.T.

Science News Letter, April 26, 1941

It takes 60 to 70 yards of cloth to make an ordinary-sized *parachute*.

The Bronx Zoo will have its first featured exhibit of *insects* this spring.

Army *ski troops* that wintered in Mount Rainier area trained with various kinds of snowshoes, ski equipment, sleeping bags, tents, stoves, and dehydrated foods, to determine the most practicable types.

GEOLOGY

Map of North America Is International Enterprise

A GREAT map of North America, showing in detail all present indications of the vast glacial sheets that once lay thick on this continent, is being undertaken as an international scientific enterprise by a committee of 16 geologists of the United States and Canada, under the general chairmanship of Prof. Richard F. Flint of Yale University. (*Science*, March 28.)

While the general outlines and some of the details of glacial development that began about a million years ago are well shown on some of the older maps, geologists have long known that for real accuracy an entirely new map on an entirely different order of exactness would have to be compiled; and it could not be a one-man job. Hence the formation of the present group. It is expected that their work will require many years for full completion, since even the best of geologic data now on hand leave many blank spaces on the North American glacial map.

Science News Letter, April 26, 1941

HERPETOLOGY

"Water-Goggling" Helps In Study of Turtles

LEWIS J. MARCHAND, of the University of Florida, told the American Society of Ichthyologists and Herpetologists how he has developed an intimate acquaintance with turtles by becoming a kind of temporary turtle himself. He puts on a pair of watertight goggles made of a circular piece of glass set into a piece of inner tubing, and goes right down among his hard-shelled friends.

Swimming is all right, said Mr. Marchand, but for getting around faster in Turtledom he hangs onto the bottom of an outboard motor boat by a special handle, sticking his head up (like a turtle) for air once in a while, and lets a friend take care of the details of propulsion.

Science News Letter, April 26, 1941

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PSYCHOLOGY

Rats Have Heredity Weakness That Puts Them In Convulsions

Seizures Occur When Animals Are Faced With Problems Which They Cannot Solve; Other Behavior Also Abnormal

RATS with hereditary weakness that throws them into epileptic-like convulsions may lead to new understanding of human nervous breakdown, psychologists learned at the meeting of the Midwestern Psychological Association in Athens, Ohio. A method of preventing or curing this common and war-aggravated mental ill is a future possibility.

One strain of rats of "neurotic" descent was reported by Dr. William J. Griffiths, of the University of Cincinnati. These animals go into severe convulsions when they are faced with problems they cannot solve. They act in other abnormal ways. They have muscular twitches, mild convulsions, and abnormal muscular contractions. But glandular treatment is giving "excellent results" in curing or relieving their convulsions, Dr. Griffiths reported.

Another "family" of rats, described by Dr. Norman R. F. Maier, of the University of Michigan, has a hereditary noise-weakness which causes them to go into fits when they hear the sound of jingling keys.

Jitters and war nerves produced by the crash of exploding bombs and the shriek of shells and air raid warnings may be a human parallel to this hereditary noise-weakness in rats.

But another link between the convulsions of the rats and human mental illness was reported by Dr. Maier. The sanity-restoring convulsions produced by the drug metrazol, now rescuing thousands of human "living dead," are somehow tied up with this hereditary noise-weakness, he found.

In rats of noise-sensitive heredity, convulsions produced by metrazol are not at all the same as they are in normal animals. They last much longer, and are more severe.

In normal rats, metrazol convulsions are very much like those seen in human patients.

After injection of the drug, there is only a short wait—never more than two to four minutes. Then comes a sudden spasm that twists the spine and draws up all four legs and feet. This contraction is followed by a second phase in which muscles are contracted and relaxed with great rapidity. The whole seizure lasts only one minute.

In the noise-sensitive strain, a much smaller dose is sufficient to bring on a convulsion, but the onset is frequently delayed. The spasm of contraction is followed by rigidity and extreme sensitivity. Then comes a series of hopping or leaping movements which is similar to those Dr. Maier has observed in rats with what he believes to be a true "nervous breakdown." This whole thing may be repeated again and again after the one dose of metrazol. Dr. Maier has seen animals go through a series of 26 separate convulsions.

In previous research, Dr. Maier produced nervous breakdown in rats by a situation in which they were punished for doing what they had previously learned was right. But at that time the mental conflict was complicated for the animals by the noise of a blast of air, so that some psychologists have believed the seizures might be due to the noise.

Dr. Griffiths' results seem to confirm Dr. Maier's earlier findings. His rats, although bred from a noise-sensitive strain of animals, went into convulsions when they were unable to solve problems. They were not exposed to noise.

Science News Letter, April 26, 1941

Why of Votes in Congress

PARTY lines in the Senate are not the same as in the House of Representatives. In the House, it is a Republican-Democrat division. But in the Senate, it is New-Deal—Anti-New-Deal.

This was revealed by a complicated modern statistical study of congressional votes cast, results of which were reported by Drs. Hilding B. Carlson and Willard Harrell of the University of Illinois.

Insight into hidden factors behind legislative votes not provided even by the intimate acquaintance with Washington of newspaper correspondents may be obtained by this technique, the scientists told the meeting.

A second factor producing voting blocks in the Senate is, they found, economy except in the matter of defense —a conservative outlook. A third way by which votes are lined up is by attitude toward Government re-organization and toward PWA and WPA. Another appears to be isolationism and a tendency to favor own constituents.

In the House, too, there is a line-up of votes for economy, and another for the protection of American interests.

In both houses there were factors that linked certain individuals in their voting, but for which the significance of the tie was not clear.

Science News Letter, April 26, 1941

Zoo animals in England are learning to eat *substitutes:* Kashmir deer, for instance, eke out small rations of the usual corn and hay with roots, vegetables and acorns.

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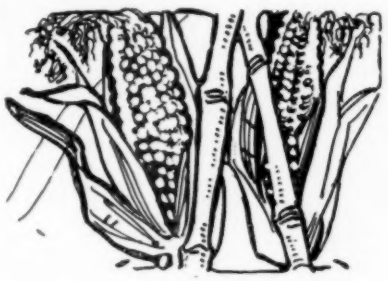
RADIO

Dr. Harlow Shapley, director of Harvard College Observatory, will tell about his latest measurements of the globular star clusters, spherical masses of thousands of stars surrounding our Milky Way System, as guest scientist on "Adventures in Science," with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Thursday, May 1, 3:45 p.m. EDST, 2:45 EST, 1:45 CST, 12:45 MST, 11:45 a.m. PST. Listen in on your local station. Listen in each Thursday.

AGRICULTURE

NATURE RAMBLINGS
by Frank Thone



Hybrid Corn's Conquests

HYBRID corn, one of the biggest things that has happened to American agriculture in its whole history, struggled for recognition for more than a decade. Even three years ago, only a comparatively narrow strip in the heart of the Corn Belt, from eastern Illinois to central Iowa, was sufficiently sold on the hybrid corn idea to devote as much as half its farm acreage to it. But last year the whole farm belt "went hybrid" with a bang: the 50% mark was passed for its acreage as a whole, and the percentages for the three main states, Iowa, Illinois and Indiana, were 88, 77 and 66, respectively, *The Nation's Business* reports.

Increasing radically as it does the yield per acre (100 bushels to the acre is not uncommon), hybrid corn makes possible an increased yield per farm, but at the same time a decreased acreage devoted to corn, which is a soil-costly crop because it requires clean cultivation and thereby exposes the soil to water erosion on sloping fields. Its roots go deeper than do those of the old-type corn, thereby bringing up plant nutrients and moisture from levels formerly beyond corn's reach. Its straight, strong stalks stand up better against summer windstorms, and are more easily handled by corn harvesting machines. Taken altogether, hybrid corn is nothing less than an agricultural revolution.

It has also revolutionized agricultural practice in another respect. Seed-corn of the old type was seldom purchased. The farmer simply picked out the best-looking ears from his crop and saved them. All too often that fine appearance concealed hereditary weaknesses. But there was no other way of selecting seed; and the method had at least the virtue of providing seed at little cost. Hybrid corn seed, however, has to be raised by specialists and purchased by the farmer every year. And it is not cheap; it costs from $4 to $8 a bushel. Nevertheless, the increased yield is so great that the expense seems worth while to most farmers.

Areas outside the Corn Belt, especially in the drier lands to the south and west, from Nebraska to Texas, are now beginning to come into the hybrid corn empire. New varieties will have to be originated, to cope with the more severe summer heat and drought of that region, but they are already on the way. Hybrid corn has conquered.

Science News Letter, April 26, 1941

RESOURCES

Cosmetics Not To Be Rationed, Regardless of War Emergency

Substitutes From Native Resources Replacing Imports; Changed Formulae Can Yield Satisfactory Products

YOU can relax, girls, and use that bright red lipstick and the rest of your beauty kit freely. Washington does not share Hollywood's alarm that great defense industries will get into the hair, so to speak, of the feminine beauty and charm trade.

True, some chemicals that go into lipstick, rouge, cold cream and other cosmetics are also stuff that explosives and war goods are made with. But, America knows its resources better these days, and there is a confident feeling among officials and drug trade experts that the United States can contrive a satisfactory substitute for almost any cosmetic material that may be diverted to defense channels or be blockaded from our shores.

Talc for talcum powder, for instance. Italy used to be a mainstay source and American manufacturers who looked providently ahead laid in stores of the Italian talc which now come in handy. Meanwhile, talc shipments come from India and other Far East countries and America's own sources of talc are getting attention. Our own talc is not so easy to convert into fine powder, but it can be done.

Important in face powder is zinc oxide, which is considered irreplaceable in making rubber, and is widely used in paints, galvanizing and automotive industry. Face powder can get along without zinc oxide if need be, by using titanium oxide and making some other changes in the formula.

There are cosmetic substitutes for nitrocellulose, which is a nail polish material and at the same time material for munitions and airplane wing coatings. And cellulose products, after all, can be produced in this country from our own wood pulp, cotton linters, cornstalks, peanut shells, and many another plant material.

Bromine and other chemicals used in lipstick dyes are not getting in the way of defense industry needs at present. If they should, substitutes can be evolved, a chemist explained. And so it goes, with prospects of need for resourcefulness in some cosmetic production, and possibly new formulas for old. Chief headache of manufacturers is more likely to be shortage of experienced workers than material, one official foresees.

With no need to worry that American women will have to go back to nature, or rub beet juice on their lips and rose petals on their cheeks, a la Victorian grandmothers, the 1941 cosmetic prospects are for brighter and gayer faces. Shy colors of 1940 are giving way to patriotic reds. And cosmetic manufacturers look to a widening market, as more women get defense industry jobs and have money to spend on charm and beauty.

That cosmetics have become a necessity for feminine happiness, instead of a luxury, as they once were is the view of one government official who deals in the safety of such products. Women lean on cosmetics for backbone, is the way he puts it. We could do without them, certainly, if we should have to choose between beauty goods and things needed to maintain life. But there is no sign on the horizon that American women will have to take the grim stand that British women have had to take since December —getting along with 25% of the normal manufacturers' output of these cheerful aids to living.

Science News Letter, April 26, 1941

Ants can go without food for months, and stand freezing cold and submergence under water for days.

First Glances at New Books

ANTHROPOLOGY

DRUMS AND SHADOWS, Survival Studies among the Georgia Coastal Negroes—Georgia Writers' Project — *Univ. of Georgia Press,* 274 p., pl., $3. Along Georgia's coast are still living Negroes who remember parents or grandparents born in Africa. Customs and beliefs from this special heritage, destined to vanish soon, are recorded in this special study, with innumerable quotations from the Negro people themselves.

Science News Letter, April 26, 1941

AERONAUTICS

BUILDING AND FLYING MODEL AIRPLANES—Air Youth of America—*Appleton-Century,* 246 p., illus., $2. This book, by experts in the field, describes in detail every step both in the building and in the flying of all kinds of model airplanes. Recent developments are included.

Science News Letter, April 26, 1941

AERONAUTICS

AIRSCREWS (Pt. I)—E. Molloy and E. W. Knott, eds.—*Chemical Pub. Co.,* 132 p., illus., $2. This new book in the publisher's "Aeroplane Maintenance and Operation Series," which is of British origin, deals with the maintenance and repair of the de Havilland controllable pitch airscrews (propellers in American) and hydromatic airscrews.

Science News Letter, April 26, 1941

BIOLOGY

INCREASED STIMULATION OF THE ALGA STICHOCOCCUS BACILLARIS BY SUCCESSIVE EXPOSURES TO SHORT WAVE LENGTHS OF THE ULTRAVIOLET—Florence Meier Chase —*Smithsonian Institution,* 16 p., pl., 15c. (Smithsonian Misc. Coll., Vol. 99, No. 17).

Science News Letter, April 26, 1941

TELEVISION

THE MYSTERIES OF TELEVISION—Arthur Van Dyck—*House of Little Books,* 55 p., illus., $1. A paper-bound pamphlet giving a concise discussion of the present state of television.

Science News Letter, April 26, 1941

ART—ANTHROPOLOGY

INDIAN ART OF THE UNITED STATES — Frederic H. Douglas and Rene d'Harnoncourt—*Museum of Modern Art,* 219 p., 16 color plates, numerous photographic illus., $3.50. Very beautiful illustrations are the conspicuous feature of this fine book, which pictures examples of Indian art and craft work from different areas, including Alaska. Accompanying text enables the reader to appreciate Indian art, from both aesthetic and technical standpoints.

Science News Letter, April 26, 1941

LIBRARY SCIENCE—ECONOMICS

THE CREATION AND DEVELOPMENT OF AN INSURANCE LIBRARY (2d. and rev. ed.) —Daniel N. Handy—*Special Libraries Assn.,* 44 p., $1. The 16-page introductory text will be of value to special librarians, especially those organizing new libraries; appendices include a 10-page bibliography on insurance, a list of insurance libraries, a list of insurance annuals and a description of classification schemes.

Science News Letter, April 26, 1941

ANTHROPOLOGY

RACE, SEX AND ENVIRONMENT — J. R. de la H. Marett—*Chem. Pub. Co.,* 342 p., diagrams, $8.50. The role of mineral deficiency in shaping human evolution is analyzed in this thought-provoking study. Dr. Marett holds that mineral deficiency has influenced selection both for bodily and mental characters. The many questions which the theory raises call for research by soil chemists, geologists, psychologists and other specialized workers, which, he foresees, would have valuable theoretical and practical results.

Science News Letter, April 26, 1941

TECHNOLOGY

SOLDERING FOR WORKSHOP, FARM AND HOME—John Bonert—*Orange Judd,* 111 p., illus., $1.25. Ability to solder successfully is one of the most useful accomplishments for a "handy man about the house." He can find detailed instructions in this little book.

Science News Letter, April 26, 1941

AERONAUTICS

HORIZONS UNLIMITED, A Graphic History of Aviation—S. Paul Johnston—*Duell, Sloan and Pearce,* 354 p., illus., $3.75. Clearly drawn diagrams and many illustrations add to the interest of this excellent history of man's effort to climb from the bottom of the ocean of air in which we live.

Science News Letter, April 26, 1941

GENERAL SCIENCE—EDUCATION

A CHALLENGE TO SCHOLARSHIP—W. Mansfield Clark—*Univ. of Penn. Press,* 20 p., 50c. A discussion of educational problems by the DeLamar Professor of Physiological Chemistry, Johns Hopkins University School of Medicine.

Science News Letter, April 26, 1941

CHEMISTRY

FIRE FROM THE AIR, The ABC of Incendiaries—J. Enrique Zanetti—*Columbia Univ. Press,* 54 p., 50c. This pocket-sized pamphlet will be of interest to those who want to know the technique of aerial incendiary bombs used in Europe, and the defenses that might be used against them.

Science News Letter, April 26, 1941

TECHNOLOGY—ECONOMICS

THE PETROLEUM INDUSTRY, An Economic Survey—Ronald B. Shuman—*Univ. of Okla. Press,* 297 p., $3. A comprehensive discussion of the fundamental economic aspects of oil production. Transportation, marketing, financing and personnel management are among the topics discussed.

Science News Letter, April 26, 1941

CHEMISTRY

PHOTELOMETRIC CLINICAL CHEMISTRY —William S. Hoffman—*Morrow,* 254 p., $3. The photelometer is an instrument for the colorimetric analysis of solutions with the use of the photocell, which was developed by Drs. Sheard, Sanford and others at the Mayo Foundation. This is a concise manual of its use in clinical and biochemical laboratories for quantitative methods in photometric chemical analysis.

Science News Letter, April 26, 1941

MATHEMATICS

INTRODUCTION TO LOGIC AND TO THE METHODOLOGY OF DEDUCTIVE SCIENCES (Enl. and Rev.)—Alfred Tarski—*Oxford Univ. Press,* 239 p., $2.75. This book first appeared in 1936 in Polish, then in a German translation, and was a popular work. In the new edition, it was turned into a text for an elementary college course in logic. The translation into English is by Olaf Helmer.

Science News Letter, April 26, 1941

CHEMISTRY

THE CHEMICAL ACTION OF ULTRAVIOLET RAYS (Rev. and Enl.)—Carleton Ellis and Alfred A. Wells; Rev. by F. C. Heyroth—*Reinhold,* 961 p., $12. Most familiar chemical action of ultraviolet radiation is in the sunburning of the human skin. However, related processes have many important industrial applications, some of which were covered in the first edition (1925) of this authoritative work. Many advances have been made since then, which are covered in detail in the present volume.

Science News Letter, April 26, 1941